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Antidepressant Effect of Phoenix Dactylifera via Involvement of Dopamine and Serotonin System

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Phoenix dactylifera (Ajwa dates) is a well-known medicinal plant found in Asian and Arab countries and it is extensively used in Muslim world due to its religious and traditional believes like prevention and cure for chronic diseases. In this study, antidepressant activity of methanolic extracts of Phoenix dactylifera fruit (PDF) and Phoenix dactylifera seed (PDS) were investigated by using tail suspension test (TST), forced swimming test (FST), open field test (OFT) and hole board test (HBT) in Sprague Dawley rats. In TST rats struggling efforts and immobility time was determined. The results represented that highest activity was recorded for PDS followed by PDF being 75% and 65% accordingly. The FST was evaluated on the basis of rats climbing and immobility time. FST exhibited similar results as shown in TST, being highest for PDS (65%) and lowest for PDF (30%). In OFT the exploration frequency, locomotory behaviour, number of frozen events and immobility time were monitored. PDS remained highest active extract with 60% antidepressant activity followed by PDF (45%). During HBT, exploratory behaviour of rats towards holes was observed and scored in terms of number of head-dips and exploration time. Both extracts showed good antidepressant activity, but maximum value was exhibited by PDS (70%) followed by PDF (65%). Quantification of dopamine and serotonin was carried out by HPLC. PDS treatment led to significant ($P < 0.05$) rise in the level of dopamine neurotransmitter in the midbrain region but PDF treatment had no significant effect on increase in dopamine level ($P > 0.05$). Collectively, present study suggests that Phoenix dactylifera can be used as an herbal drug against depression and neurobiological syndromes due to its pharmacological effects. However, further research is needed to identify and isolate those specific components which are responsible for antidepressant activity.